

MIU Users Association of America

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(800) 966-1030 (703) 339-8500 Fax (703) 339-5406



May 1991 Newsletter

Inside This Issue...

- * Interview with Steve Bonica, Vice President, Audio Video Systems Group, Panasonic Communications and Systems Company**
- * Interview with Dan Hall, Video Management Systems, on Betacam Interface**
- * Service Bulletins on Head Cleaning and Improvement of Power Supply Beat**
- * April Survey Results**
- * Latest Membership Listing**

Plus a whole lot more....

Commentary from the Executive Director

Unbelievable! In the time since NAB, we've added over 70 new member facilities to increase total membership to over 120. (See listing herein) And the networking that is taking place between users, dealers, owners, affiliates and producers make running this association extremely rewarding. Member's input in the form of letters, survey responses, phone calls, faxes has been overwhelming. And all this at a time when industry experts are stunned by what appears to be a major resurgence in MII sales domestically and worldwide.

It's true...MII is experiencing an unprecedented format "renaissance" that has Sony scratching their collective heads. And although this new market growth can be attributed to an aggressive Panasonic advertising campaign, a very reasonable pricing structure for the new line of MII equipment and an effective dealer marketing program, one underlying factor must also be noted... the people who work with MII...like it...and as the saying goes, "if you build a better mousetrap, the world will beat a path to your door" (eventually).

The fact is, MII has been around too long, has been proven to work in too many applications and has simply pleased too many clients for the exaggerated MII death claims made by the Sony salesmen to be believed. Slowly, but surely, industry professionals have come out of the woodwork to pay the format the respect it deserves, allowing MII to shed the ugly duckling, underdog image that Sony loyalists have tried to paint for it. Educated production professionals now fully recognize MII's parity and advantages when compared with Betacam SP and One inch. So for those MII supporters who have hung in there since 1987...smile...your time has come.

In this issue we have a comprehensive head cleaning bulletin that is worth having your technicians take a look at. In addition there is an in depth interview with Panasonic Head Steve Bonica, and a range of new features including a trading post for buying and selling MII equipment. Most importantly, please...keep those cards, letters, faxes, phone calls and survey responses coming! Your fellow MII members are depending on your input and ideas! Incidentally, keep your eye out for the full page ads we're running in national video trade magazines. They'll include the name and location of all user association members to let readers know where the nearest MII facility is. We'd be interested to hear the response people get on this. And to all the "Sony only" types out there...Eat your heart out...you just can't keep a good format down!

At NAB, MII Users Association Executive Director Dave Gardy (center, top row), posed for publicity shots with several MII supporters.

MIT Users Association Buttons are Available, just send us a stamped (58 cents postage), self addressed envelope, and we'll send you a button.
MIT Users Association of America, c/o GMG International, Inc., 8580 Cylinder Rd, Suite 1000, Newington, VA 22122, Attn: Debbie



Survey Results From April

The results are in from our survey questions in the April Newsletter. Over 86% of those facilities going outside for MII service support rated the support good or better. It was also interesting to note that 29% of all respondents were doing their own service.

The tape availability issue is a concern to over 37% of the respondents. We will take this up with Panasonic. Nearly half of those responding also felt the tape consignment to the dealers would help to alleviate periodic hic-cups in supply. We hope to have a formal response back from Panasonic on the consignment issue which will be featured in the next newsletter.

Here they are:

How would you grade the service and support available for your MII equipment?

Excellent	Good	Fair	Poor	Do Own Service
38.09%	23.8%	4.76%	4.76%	28.57%

Do you feel there is adequate MII tape availability in your geographic area, for quick response requirements?

Yes	No
62.5%	37.5%

Do you think that the manufacturer should supply the tape in quantity to dealers on a consignment basis?

Yes	No	No Opinion
46.66%	6.66%	46.66%



Chicago Service Support, Job Well Done!

Congratulations go out to David Glogowski of the Chicago Technical Service Office in Arlington Heights Illinois, for a Job well done. In recent conversations with MII users, we have repeatedly heard good things about the service performed in the Chicago office. We wanted to take this opportunity to thank David and his staff.

MII Trading Post

Equipment For Sale

AU 500 Portable MII Videotape Recorder, New in 1987, Approximately 600 head hours, Excellent working condition. Also includes: Manual and A/C power supply. Asking \$4,500.00 Contact Dan Hall, Video Management Systems, 1004 E. Washington Street, Indianapolis, IN 46202, (317) 639-6163.

AU 500 Portable MII Videotape Recorder, New in 1989, Approximately 160 head hours. Also included: Manual, Portabrace carrying case and five cases of new 20 minute tape stock. Asking \$5,800.00 Contact Bob Abrahamson, West Net Video, 20023 Legend Oak Drive, Humble, TX 77346, (713) 852-7883.

JVC KR-M800U MII Edit Recorder, purchased new June 88. Low head hours, Asking \$7,300.00.

JVC KR-M 460U Portable MII Videotape Recorder (Same as Panasonic AU 520), purchased new Dec. 88. Very low head hours. Also included: one Perrott PE-90 Nicad battery pack and charger, all in an Anvil case. Asking \$7,900.00.

JVC SA-T310 TBC for MII, purchased new Aug. 88. Asking \$4,575.

Generic Design SCA-850 Parallel to Serial w/timecode send, used with KR-M800U, purchased new June 88. Asking \$1,000.00.

All equipment is in excellent operating condition and has been properly maintained. If you buy the MII equipment as a package, 8% (\$1,662) will be deducted. Additional equipment available. Contact L.A. Lentz, Lentz & Associates, P.O. Box 6181, Raleigh, NC 27628, (919) 828-6761.

If you have equipment you would like included in the next Trading Post, call us at (800) 966-1030, (703) 339-8500 or Fax (703) 339-5406.



MII Users Association of America to Sponsor MII Video Production Awards

Plans are currently underway to organize a multi-catagory award contest to recognize top production efforts mastered on MII. The contest will be jointly sponsored by the Association and Panasonic and will include those presentations produced since MII's entry into the market in 1987. Please feel free to provide input or suggestions regarding the contest format. Stay tuned for more details on this. Final plans will be announced in the next newsletter.

Indiana Facility Finds Betacam an Easy Interface with MII

Dan Hall of Video Management Systems recently spoke with us on the subject of Betacam interface with MII. As a facility owner in Indianapolis, Indiana, Dan supports a client base that frequently requires Betacam/MII interface.

"On some industrials," Hall states, "some of the footage clients already have is Betacam. We bump it to MII component to component and it looks just as good as the original Betacam. We also get footage in various formats; Betacam, Betacam SP, One-inch, whatever. It all converts nicely to MII." We asked him about the process of dubbing from Betacam, "The levels from Betacam are sometimes a little hotter, you have to be careful, there also are special precautions you have to take, but it is not that difficult."

Hall uses a component editing system during post production to maintain peak quality throughout his projects. Sometimes he has to dub back to Betacam from his final MII master to meet client requirements.

"As a matter of fact, we did that on the Miss Black America pageant for the past two years," Hall recalls. "That's a national event. It runs in 60 markets across the United States, Canada, Puerto Rico, Virgin Islands and Jamaica. It was shot on MII, edited on MII and distributed on One-inch and Betacam. The quality is excellent. You can't tell any difference from anything else you see on TV." Hall has also worked with consumer formats in interfacing to MII, "We've even, for effect, used VHS tapes to make it like a home-documentary type tape. And when you get to MII, you can go crazy with it. It still looks pretty good. It even seems to make it look a little better." If you're interested in more details on Dan's interformat experience, give him a call at (317) 639-6163



Underwater Stock Footage Available on MII

If you have a need for footage of Maui, Hawaii or underwater scenes from Hawaii on MII or SVHS, Bob Ramacher of Video Concepts is making his stock footage library available. Call him at (808) 879-1329 or fax (808) 879-5229

Pinfeed Labels Now Available for MII Tapes!

For those users who have been trying to automate the labeling process for MII delivery to clients. Help is on the way!

Professional Label Service, Inc. has decided to manufacture MII pinfeed tape labels for cassettes and pinfeed wrap around sleeve inserts for the MII cases. They will be available late summer 1991. For more information call Rick Fry at (301) 598-2357 or Fax (301) 598-9459.

MII Duplication Facilities Ready to Support a Variety of Tape Reproduction Requirements

Duplication needs have been a frequent topic among MII users. We are including the names and addresses of two facilities who are user association members and who have received good reviews from fellow members. If you know of additional facilities, please forward their information to Debbie Stafford (800) 966-1030 or (703) 339-8500.

Centercom
Bob Harmon
5737 W. Hemlock Street
Milwaukee, WI 53223
(414) 353-2001

MagneTech
Michael Pardoe
3941 SW 47th Avenue
Ft Lauderdale, FL 33324
(305) 791-6711

MII Tape Cleaning, Evaluation and Reconditioning Now Available

Studio Film & Tape, Inc now offers its tape cleaning, evaluation and reconditioning services to MII tape users. Tape is degaused, and evaluated and an analysis is printed out on each cassette. Tape reels and cases are cleaned and damaged tape is removed. For further information contact Michael Meagher, (800) 444-9330, (212) 977-9330 or fax (212) 586-2420.

Interview With Steve Bonica

Steve Bonica joined the Panasonic Communications and Systems Company (PCSC) in October 1989 as Vice President, Audio and Video Planing, after being employed for 21 years with NBC. In February, Mr. Bonica was appointed Vice President of the Audio Video Systems Group within PCSC. He oversees all sales and marketing activities for the MII product line. Dave Gardy, Executive Director of the MII Users Association, had the chance to interview him recently.

Gardy: Throughout NAB there were rumors flying that you're planing to streamline the organization a little bit. Our question is, in terms of functional responsibilities and personnel, now that AVSG and PBSC are one group, what areas are you going to change that will benefit the MII users ... that are of concern to the MII users?

Bonica: Well I think fundamentally any changes we make will be designed to take the strength of AVSG and to apply it to the Broadcast and high end areas. The changes we're trying to make will strengthen and improve our operation so that it's as responsive as it can be to the customer base, and as well organized as it should be.

Gardy: Is there a basic philosophy guiding you, like MII's the middle market now, and DX is the high market?

Bonica: No, there is a basic philosophy, but the way it goes is that we want to excel in customer care. In order to do that we have to structure our company so that we have good communications and good resources to solve the problems of our users and to be supportive of them. Our structuring will be to enhance our servicing of our client base.

Gardy: Is it in your business plan that you've got a certain time period you're trying to complete it by, or is it something that's going to change gradually?

Bonica: No, we'll see a number of evolutionary steps a little at a time to evolve the organization so that it, as I said, it is better equipped. No, it isn't business plan related, it's operationally related, and it's aimed toward operational improvement.

Gardy: A lot of the MII facility owners know that you are from NBC, and some have expressed concern. I heard a few at NAB say that this guy is from NBC what does he know about the facility owner? I wanted to give you a chance to put their minds at ease and tell us that you do have concern for the facility owners, that you do have an understanding. Just today I got a fax from NBC New's Stu Pearman up in Long Island City asking to have him added to the membership. It's interesting that we're drawing some network people, and a lot of affiliates too.

Bonica: That's good, you mentioned that when we first talked.

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Gardy: I never anticipated it to be a facility user verses NBC thing. I think what drives that is the problems that are associated when we call up and hear certain things that maybe should be said a little differently, such as "NBC sucked up the parts at the end of the fiscal year, or NBC ate up the tape supply. We don't have any more left for you, or NBC has first dibs on this." Whether those rumors are true or not, it almost puts us at odds with them. We know that we're not the largest customer and we have to fight for what attention we get. But can you put the MII user's mind at ease that you have an understanding of the facility owners and that you're not going to let NBC overwhelm Panasonic in terms of support requirements.

Bonica: I'm concerned with any user of our equipment. I think I fully understand, having been in the entertainment industry for twenty years, how this may look like a vast industry but it isn't. Everybody talks to everybody, and it's really a quite close knit industry. For that reason, it's of paramount importance that Panasonic understand its end users as professional users, all of them equal. We should bear in mind at all time that disappointing any one of them is not in our best interest. So, what the new vice president brings to the office is perhaps not an experience as a facility owner, but certainly the experience of a professional end user who has experience in everything from film editing to television production. I think I have a good feel for what goes on in a professional facility.

Gardy: While we're on the subject, I don't think your background has really been publicized, other than that you came from NBC. Do you want to take the opportunity here to give a brief description of where your experience has been.

Bonica: My NBC career was very long. It started almost as I finished college, I was there for over twenty years. I started as a film editor, then a video tape editor and then ran NBC's news gathering operation where it concerned editing. I then became supervisor, manager, then director of NEC news videotape operations. During those first twelve years, up to that period which ended as director of videotape operations, there was extensive travel all over the world and I worked in numerous facilities, TV stations, production houses in the process of news gathering and editing news. And then, the last eight years I was moved to operations and technical services where I was director of facilities engineering which included the production systems, mobile units and facilities of NBC's that were very much like outside production houses. We built many midrange to low end, midrange to high end post production edit suites, studios, mobile units and control rooms. I was responsible for that and in a year and a half I was then promoted again to the vice president of engineering and became responsible for all of NBC's technology and facilities, and the capital plan for technical facilities, not for buildings. So, I hope I can translate my background into a great understanding of what it's like to be a user and that's something I can say that I'm going to try very hard to do.

Gardy: In reality you've got the basic background a lot of these users have.

Bonica: One thing that I'm holding myself to, a personal goal is to bring the user's perspective to this operation. That's the reason I am intent on making some operational changes so we can become more user oriented. In my internal policy speech at NAB, I did a talk, very unlike the normal practice, but it

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was on customization, that is, tuning our operations to our users. The rest of our organization is becoming more aware of end user's needs, even when the product travels through dealers. Our products may travel many routes, but our mindset, our desires are always with the end user, to serve them well. That's the point.

Gardy: On the MII technical training issue, I talked to someone today who had somebody in that training class that was cancelled and was moved to May. I think we're still looking at 48 training sessions this year but I heard through the grapevine that you were considering asking Matsushita to kick in more bucks to have more equipment or more people in the training site, to meet the new demand that's created by the increased sales. I guess my question is, what has been expressed by a lot of users: Why can't Matsushita, a giant company in the world in terms of electronics, finance more training to meet the needs? Is it related to sales volume before they make the investment or is there anything you see in the future that's going to allow for more than 48 sessions a year, maybe a couple of hundred sessions a year? Can you comment on that?

Bonica: Training sessions are really held in response to customer needs. And if there's a need for more, we'll address that. I wasn't aware of a need for more training. I'm not sure I understand the question -- more subject matter?

...

Gardy: Well, when they were originally scheduling the first training session for this year, they had twelve spots open from around the country and people were fighting to get in the spots because the dealers were now interested in getting teched up to support their customers. Wint Ramsey was very concerned about it too. And he said now that PBSC was part of AVSG there would be a lot more funding available for training. Then ironically, the first session got cancelled. But I think we're looking at a lot more than just a couple of extra sessions. Wint said it boils down to many things: the equipment, the support equipment you need for that training, and then the people to do the training are spread pretty thin. I guess the question is, if MII experiences a major format growth like we want it to and that it looks like it is going to develop into, are we going to be able to meet the demand? And can Matsushita kick in some money to get more training people? It's always been a cry from us down here in the Mid-Atlantic because we've only had Mike Vaia running around since 1987.

Bonica: Let me address part A first, the cancellation of the class. I guess I feel that the cancellation could have been avoided. I had a discussion with our staff about what happened. And I think I found the real source of the problem in this case, and I think it's avoidable. It didn't really have to do with capital hardware or investment or anything of the sort. It had to do with management and planning. I firmly believe it can be averted. I feel in the case of the cancellation of the class, we can do much better in the future and not have a repeat of classes being cancelled.

Gardy: Then you wouldn't rule out the possibility of adding additional classes.

Bonica: No. I also think that given a little time we can improve the number of classes that we're holding and perhaps also the topic areas, go horizontal

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also, a couple more areas. But certainly, I feel that we can avoid in the future the unfortunate circumstances of having to cancel classes. And, I think we can hold more too. We have already looked at why the class was cancelled and I think we've established countermeasures so that doesn't happen again. And I will certainly take up the issue of holding more frequent, and perhaps more in depth subjects, right away. And maybe we'll have something to say in the not too distant future about what we can do there.

Gardy: I think that's great because it's a concern especially of the older users who recognized when the existing service structure was overwhelmed. I think my comment in a magazine interview was that it's great service, it's just sometimes hard to get. And I think the training course structure, the way you guys teach it, is super. It's very diligent. You even test the people, which is unheard of in a lot of cases. Usually people just plunk their money down and get the training. I think you guys are interested in making sure they learn it. And that's great to know. I think the new training probably is going to incorporate a lot of the new equipment, which is good because that's where the bulk of the sales are now. But, there's still a need for a knowledge base on the old 650's and the 500's including software updates. Next question. Somebody expressed the idea of a user's forum where once a year MII representatives would come to New Jersey and meet with you and maybe be reimbursed to help cover the cost for people who have to come from a far distance. The users would meet one-on-one with the appropriate people, have a service meeting, a marketing meeting, and feed-back one-on-one, like "we're having these kinds of problems in Chicago" or "we're having these kinds of things in LA" ... "here are the good things that are happening" Are you amenable to something like that, maybe fifteen or twenty people from around the country coming in as a Users committee and interfacing with the people there in Secaucus?

Bonica: I'm absolutely amenable to it. In general, I'd like to say that I've been here just a couple of months and I feel badly that I haven't been able to get out and meet many users and dealers that are part of the Panasonic family. As time goes on, that will be a high priority but there are certain things that need to be addressed right away. But I do want to get out and will spend more time listening to the Panasonic family, the users especially. We are very focused on end users, especially for input about operations and product. I want to look at this idea, but there's no question it's very possible we could set up some kind of forum where folks are invited in and have a chance to see what we're doing.

Gardy: Let me get to the last question and then I'll let you go. What input do you want from the MII users that will help you sell MII and make the MII Users Association of value to you and Panasonic? What kind of input are you looking for?

Bonica: The message I'd like to deliver to them is, that there is no question that MII is a very serious product area for us here at Panasonic. They should also know, and I don't know if you've reported this before, MII usage around the world is growing at a rate that's making us very happy. The factory is constantly challenged to keep up with worldwide demand. I'm not sure that has been pointed out to you.

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Gardy: Well, I think Stan Basara pointed that out in the last newsletter that sales have doubled.

Bonica: Was he talking worldwide, or domestically

Gardy: I just asked him in general and he said they doubled. I think it was in reference to the last three months and the excellent Panasonic advertising that's been done. I think the "MII offers 1 inch quality at 3/4" prices" campaign has been a success. I think the advertising your doing, we've got a lot of good feedback on. I think it's all catching SONY by surprise. And the ad agency you're using, RDA, is doing a great job in producing those ads.

Bonica: The other thing you might mention is that worldwide it's growing even faster.

Gardy: How about input from us? What do want from us that can help you.

Bonica: No question that this product line will continue to evolve. So we certainly want to be constantly in touch with end users to get their ideas and thoughts on future products, and also on how we're doing. We're serious about doing better in the area of user service, customer support. We need to have, at all levels of organization, feedback about how we're doing, where our strengths and weaknesses are, and continue efforts to improve. We need to know what's working well and what's not working well. And so I invite them all to call us here anytime and give us feedback, or through the work that you're doing, there's another excellent way to communicate with us.

Gardy: Well I appreciate that. We're looking forward to the future

Bonica: Good, excellent. Well all right, Dr. Dave, it was fun talking to you.



Monthly Survey Questions

Each month the users association will poll users on specific MII issues and publish the results in the next newsletter. This months questions are:

1. In MII post production, what is the greatest number of passes (generations) you are going down (for multi-layered effects, etc.) and still producing a professional quality master?

Check one 1[] 2[] 3[] 4[] 5[] 6[]

Comments _____

2. Video Head Life

A. How many hours are you consistently getting on your MII video heads before they require replacement?

Editing Decks

Check one

- 1000-1500
- 1500-2000
- 2000-2500
- 2500-3000
- 3000 or more

Portable Decks

- 1000-1500
- 1500-2000
- 2000-2500
- 2500-3000
- 3000 or more

B. What type of environmental conditions are present in the room(s) where your MII equipment is located?

Check those that apply

- Non smoking environment
- Filtered air
- Temperature kept between 65 and 75 degrees F
- Other measures taken_____

Additional Comments _____

3. Are you considering the purchase of Panasonic's half inch digital format?

YES NO

If so, how serious are your current acquisition plans?

- Definitely will acquire
- Most probably will acquire
- Maybe will acquire
- Undecided

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4. What source footage are you using in post production? Please check those that apply and include percentage of use.

MII?	<input type="checkbox"/>	% of use _____
Betacam?	<input type="checkbox"/>	% of use _____
Betacam SP?	<input type="checkbox"/>	% of use _____
SVHS?	<input type="checkbox"/>	% of use _____
3/4 inch?	<input type="checkbox"/>	% of use _____
3/4 inch SP?	<input type="checkbox"/>	% of use _____
8mm?	<input type="checkbox"/>	% of use _____
VHS?	<input type="checkbox"/>	% of use _____

5. Do you have any ideas how the Association can better serve the members?
Comments _____

It is most important for the membership that you respond to these questions, either by mail, phone or fax, prior to June 15. Your input is greatly appreciated.

(800) 966-1030, (703) 339-8500, fax (703) 339-5406

MII Users Association of America
c/o GMG International, Inc.
8580 Cinderbed Rd, Suite 1000
Newington, VA 22122
Attn: Debbie

MII Service Bulletins to be Made Available to MII Users Association of America

Mr. Jerry Spencer, MII Users Association point of contact for Panasonic is currently endeavoring to assemble all service bulletins for a complete range of Panasonic MII products on disc to allow the membership quick access to them. Several scenarios are under consideration including an on-line software system that would permit user access 24 hours a day. This system may take some time to get up and running. As a first step, we will be providing a list of service bulletins available in hard copy, that association administrative coordinator, Debbie Stafford will be able to provide to interested members.

AU-650/AU-660 Low Frequency Interface

If you are an owner of an AU-650 or AU-660 you may notice a slightly discernible low frequency interference in your video signal. Depending on your system configuration this problem may be intermittent, persistent or not present at all. Mr. Tony Sangiovanni, MII Product Engineering Representative for Panasonic Headquarters has investigated this symptom and is currently providing technical assistance to those users who require it. A service bulletin to correct this in the AU-660 has been issued which Tony says should also work for the AU-650. He faxed the bulletin to us and we are including a re-print of the pertinent information for interested users. We strongly urge you to call Tony at (201) 392-6720 before attempting this machine modification. If we find this to be a model problem that is present in many units in the class, (based on input from you), we will pursue the issue with Panasonic to facilitate class wide assistance with modification to rectify any problem that may be inherent in the machines. For the most part, we have been able to identify only isolated occurrences in mostly AU-650's, but please let us know if you experience the symptoms. Panasonic has expressed an interest in helping us in any way they can. (We'd also like to hear from JVC owners on this issue.)

Service Manual

Supplement

Broadcast Video Product

Model No. AU-660/AU-640

Bulletin No.:

AU-660 Bulletin No. 174

AU-640 Bulletin No. 64

Subject: Improvement of Power Supply Beat

Please use this manual together with the Service Manual
for Order No. VQS0116, VQS0127, VQS0137

Model No. AU-660/AU-640

Board: Switching Power 1 (VEP81014A)

Symptom: The video output signal may have beat, caused by interference from the switching power supply.

Cause: Improper filtering and wiring of the power supply circuit.

Remedy: The following circuit changes were done, to prevent the power supply circuit to interfere with the Video circuitry.

(1) Capacitors C2,C3,C4,C16,C25, and C26 and coil L2 have been changed.

(2) Capacitors C27 and C28 have been added as shown in figures 1 and 2.

(3) The harness cable has been relocated away from the switching transformer as shown in figure 3.

Please refer to the Supplement Service Manual Order No. VRDME8807035 and VRDME8908117.

Parts Number				
Ref No.	Original Part No.	New Part No.	Part Name & Descriptions	PCS
C2	VEP81014A	ECQU2A224MN	Switching Power 1 P.C.B.	
C3,4	ECQ12A104MN	VCK0083	P. Capacitor 250V 0.22U	1
C16	ECKDKS222ZV	ECQU2A224MN	C. Capacitor 3300P	2
C25,26	ECQ12A104MN	VCK0083	P. Capacitor 250V 0.22U	1
C27,28	ECKDKS222ZV	ECQU2A224MN	C. Capacitor 3300P	2
L2	VLF0486	VLF0745	P. Capacitor 250V 0.22U	2
			Coil 29mH	1

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Schematic Diagram			P.C. Board	
Ref. No.	Page	Area No.	Page	Area No.
C2	5-89	F-3	5-88	E-10
C3	5-89	F-3	5-88	F-9
C4	5-89	F-3	5-88	F-10
C16	5-89	F-4	5-88	F-4
C25	5-89	F-3	5-88	F-10
C26	5-89	F-3	5-88	F-10
L2	5-89	G-3	5-88	F-2

Switching Power 1 Schematic Diagram

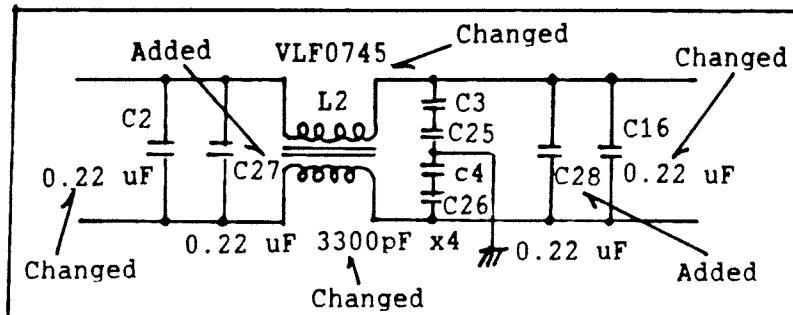


Fig. 1 Page 5-89 (F-3 4)

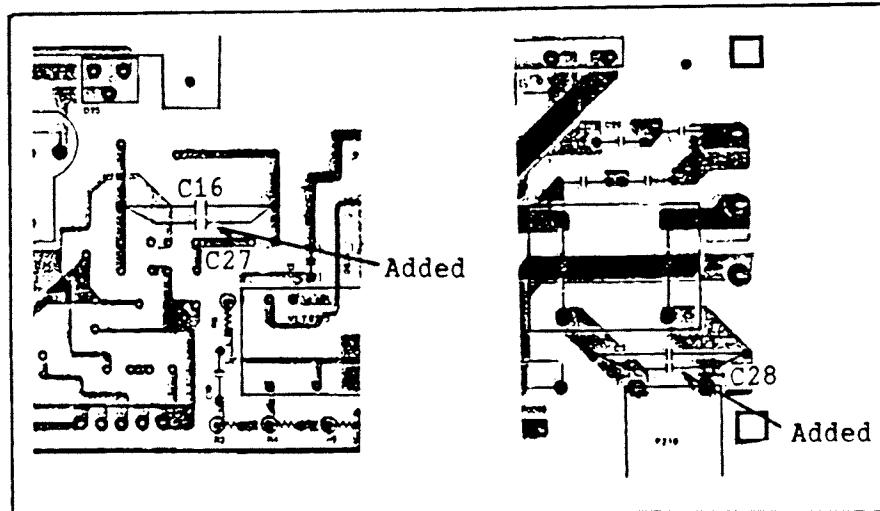
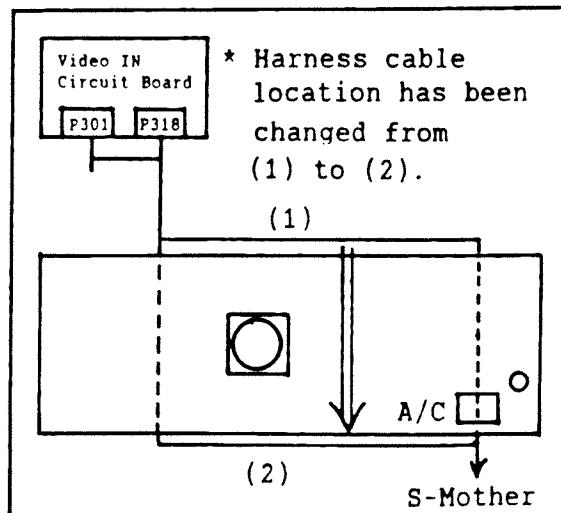


Fig. 2 Page 5-88 (F-4, E-10)

Switching Power 1 P.C. Board
(VEP81014A)

Fig. 3



MII Users Association of America

Membership Listing

2PM Multimedia	AMPROD Inc.	Bell Atlantic	Champion Auto Stores
Jim Mine	Ken Santucci	Morris Hoch	Larry Gilbertson
P.O. Box 2	4531 Stone Pine Court	1 Parkway, 2nd Floor	5520 N. Highway 169
Linden, VA 22642	Chantilly, VA 22021	Philadelphia, PA 19102	New Hope, MN 55428
(703) 636-4142	(703) 818-1353	(215) 466-3896	(612) 535-5984
3M-Bob Herman	Walter Arandia	Bell Atlantic	Erik Ciel
3M Center	4311 S. 9th St	Corporate Television	1102 Denise Circle
Building 223-SW-01	Arlington, VA 22204	Richard Deiss	Phoenixville, PA 19460-1815
St Paul, MN 55119	(703) 521-9475	340 Broad Street, Room 400	(215) 933-3380
(612) 736-2549		Newark, NJ 07101	
ADV Tech	Atlanta Video Production Center	(201) 649-3885	Cinequipt-Kevin Groves
Thomas Huckle	Joseph Gora		856 Raymond Ave
8057 Crossbridge Rd	570 Northside Dr. NW 240	Bloomquist & Associates, Inc	St Paul, MN 55114
Dublin, CA 94568	Atlanta, GA 30318	Dick Bloomquist	(612) 646-1780
(415) 833-6031	(404) 355-3398	828 N. Addison Ave	
AHO Graphics	AVA Productions	Elmhurst, IL 60126	Conus Communications
Allan Ostling	Dick Slade	(708) 530-4077	Jonathan Meyers
1089 3rd Ave., SW	1412 Northcrest Drive	Bob Benson Video Film	3415 University Ave
Suite 202	Silver Spring, MD 20904	Robert Benson	St Paul, MN 55114
Carmel, IN 46032	(301) 384-9595	287 Chappel St	(612) 642-4637
(317) 844-6322	AVEC Electronics Corp.	Holden, MA 01520	
AICPA-Jim Catone	John Heinke	(508) 829-4105	Cornerstone TV
TV Studio 5th Floor	711 Granby St	Bosworth Graves	Gary Stuart
1211 6th Ave.	Norfolk, VA 23510	Norm Bosworth	Signal Hill Dr
New York, NY 10036	(804) 627-3502	1055 S. 700 W	Wall, PA 15148
(212) 575-5490		Salt Lake City, UT 84104	(4120) 824-3930
Airtime Design	Avonix	(801) 972-6128	Communications Televideo Ltd.
Brooks Reid	Ken Muehlbauer		Paul Farren
6490 SW 113th	Bob Buss	Business TV Associates	9301 Georgia Ave.
Miami, FL 33156	P.O. Box 505	Mark Hewitson	Silver Spring, MD 20910
(305) 666-0925	3495 W. 124th St	RR 1, Box 71	(301) 585-6311
Allen Organ Company	Brookfield, WI 53008-0506	McLean, IL 61754	
Clark Ferguson	(414) 783-6050	(309) 874-2908	C-SPAN-Brian Lockman
150 Locust St	Avon Productions		444 North Capitol Street
Macungie, PA 18062	Fred Lipowitz	Centercom	Suite 412
(215) 966-2202	123 Matis Street	Bob Harmon	Washington, DC 20001
AME-Bill Messersmith	South Plainfield, NJ 07080	5737 W. Hemlock Street	(202) 737-3220
1133 W. Hollywood Way	(201) 756-0643	Milwaukee, WI 53223	
Burbank, CA 91505		(414) 353-2001	Dan Fitzgerald
(818) 841-7440	Ball State University	Center Video	P.O. Box 126
American Heritage Cable	Bill Cahoe	Rex Balz	Tecumseh, MI 45986
Brian Sawyer	University Media Services	5615 W. Howard Street	(517) 423-8124
1729 McPherson Ave	Munice, IN 47306	Miles, IL 60648	David Larson Productions
Council Bluffs, IA 51503	(317) 285-1487	(800) 621-4354	David Larson
(712) 328-7207	Bell Atlantic	Century Design	5910 Lilly Road
	Tom Erdely	Jody Heurung	Menonee Falls, WI 53051
	801 Roeder Road	530 15th Ave. S.	(414) 252-4122
	Silver Spring, MD 20910	Hopkins, MN 55343-7889	Dench Video Services, Inc.
	(301) 565-8663	(612) 935-0033	Tim Dench
			9141 Bardstown Rd.
			Louisville, KY 40291

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Don Brown Productions Don Brown 867 N. Main St Orange, CA 92668 (714) 771-9711	Greater Rochester Cable Harry Goldberg 71 Mount Hope Ave Rochester, NY 14620 (716) 325-1111	KHOG Marvin Macedo PO Box 1029 Fayetteville, AR 72701 (501) 521-1010	Little Fort Media Weldon Johnson 113-115 N Genesee Waukegan, IL 60085 (708) 244-9666
Duff Video Productions Ron Duff P.O. Box 881 Cape Girardeau, MO 63702-0881 (314) 334-1189	House Recording Studios Rick VanWinkle 8310 Rayburn Building Washington, DC 20515 (202) 225-3941	KJRH Vic Turner Dick Hogg Duane Jones 370 S. Peoria St Tulsa, OK 74105 (918) 743-2222	MagnaTech Michael Pardoe 3941 SW 47th Ave. Ft Lauderdale, FL 33324 (305) 791-6711
Eaton Corporation Jerry Martin 4201 N. 27th St Milwaukee, WI 53216 (414) 449-6216	IBM-Tommy Lee 3100 Windy Hill Rd. Internal Zip WE1C1 Marietta, GA 30067 (404) 835-3492	KPLR Tommy Gray 4935 Lindell Blvd. St. Louis, MO 63108 (314) 454-6310	Mayo Clinic Marvin Mitchell Video Communications Systems Rochester, MN 55905 (507) 284-2511
Ed Janik Productions Ed Janik RR 2, Box 94C Pleasant Plains, IL 62677 (217) 626-1976	Insight-Tom Carroll 288 Fillow St Norwalk, CT 06850 (203) 853-1115	Kramer Video Tom Kramer PO Box 22446 Seattle, WA 98122 (206) 322-6555	Media Concepts Bob Skidmore 559 49th Street South St. Petersburg, FL 33707 (813) 321-2122
E.I. Dupont-Jack Green 901 W. Dupont Ave. Belle, WVA 25015 (304) 357-1835	International Media Robert Hatch Boston Building, Suite 220 Salt Lake City, UT 84111 (801) 532-7770	KSFY Doug Loos 300 W. Dakota Ave., Suite 1000 Sioux Falls, SD 57102 (605) 336-1300	Miller Meester Advertising Dan Sauard 17 W Washington Ave Minneapolis, MN 55401 (612) 337-9120
The Family Channel Russ Murphy 1000 Centerville Turnpike Virginia Beach, VA 23463 (804) 523-7874	Iowa State University Denny Goodrich Media Production Unit Exhibit Hall S Ames, IA 50011	KTRV Brian Royster 679 6th St Nampa, ID 83651 (208) 466-1200	Mission Video Support Paul Kloda 17800 Chillicothe Rd. STE 270 Chagrin Falls, OH 44022 (216) 543-1880
Fishing the West Kerry Brown 5484 SE International Way Milwaukie, OR 97222 (503) 654-0092	Iris Multimedia Robert Logsdan PO Box 726 Burlington, VT 05402 (802) 865-9560	KUSI Richard Large 4575 View Ridge Ave San Diego, CA 92123 (619) 571-5151	Moraine Park Technical College Bob Haase P.O. Box 1940 Fond Du Lac, WI 54936-1940 (414) 929-2112
Gardy-McGrath (Intl) Inc. Dave Gardy 8580 Cinderbed Rd., Suite 1000 Newington, VA 22122 (703) 339-8500	ISDL Sam Tonnison 234 West Upsilon St. Philadelphia, PA 19119	XXXV Jerry Copeland PO Box 2522 Waco, TX 76702 (817) 754-2525	Mountain View TV Anthony Evans 1500 SE Blairstown Dr Vancouver, WA 98684 (206) 253-2588
George Mason University Henry Boisvert Univ. Drive TV Studio Fairfax, VA 22030 (703) 323-3586	KARE Cheryl Ivey 8811 Olson Memorial Hwy Minneapolis, MN 55427 (612) 546-1111	Lentz & Associates LA Lentz PO Box 6181 Raleigh, NC 27628 (919) 828-6761	Moyse & Associates, Inc Claude Moyse PO Box 831 Latham, NY 12110 (518) 783-6221
Grant Booker Video Terry Grant 2543 Nicollet Ave. S Minneapolis, MN 55404 (612) 870-0028	KBSP Tim Mance 4923 Indian School Rd. NE Salem, OR 97305 (503) 390-2202	Continued on next page	

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MATCO-Bob Brandia 2600 Lone Oak Point Eagan, MN 55121 (612) 726-0355	Preston Trucking-Bob Lyons 151 Easton Blvd. Preston, MD 21655 (301) 673-7151	Sallie Mae Charlie Hite 200 Fairbrook Dr Herndon, VA 22070 (703) 834-5737	UCLA-Behavioral Sciences Media Lab MP Gary Lord 760 Westwood Plaza Los Angeles, CA 90024 (213) 825-0448
NBC Bill Sacrey 30 Rockefeller Plaza Rm 1210W New York, NY 10112 (212) 664-7140	PG County Office of TV Resources Don Mattingly 8437 Landover Road Landover, MD 20785 (301) 386-1629	Sandia National Laboratories Jim Lloyd Organization 7212 P.O. Box 5800 Albuquerque, NM 87185 (505) 844-3867	United Artists Cable Peter Strang-Wolf 421 Allwood Rd Clifton, NJ 07012 (201) 779-2444
NBC News Stu Pearman 52-37 Second St Long Island City, NY 11101 (718) 482-8310	Professional Products, Inc. James Baldwin 4964 Fairmont Ave. Bethesda, MD 20814 (301) 657-2141	Sigma Broadcasting Don West PO Box 4150 Ft Smith, AR 72914 (501) 783-4040	United States Marine Corps Captain Glenn USMC Documentation Unit Quantico, VA 22134 (703) 640-2878
New Orleans Convention Center Mike Blohm-Technical Services 900 Convention Center Blvd New Orleans, LA 70130 (504) 582-3062	Public Broadcasting Service Mark Richer 1321 Braddock Place Alexandria, VA 22314 (703) 739-5471	Sign Media Inc. Verden Mess 4020 Blackburn Road Burtonsville, MD 20866 (301) 421-0268	Video Concepts Bob Ramacher/Kevin Harrington 1295 S. Kihei Rd, Suite J Kihei, Maui, Hawaii 96753 (808) 879-1329
New York City Sanitation Department Mike Barbarotto Audio Visual Services Unit PO Box 213 Maspeth (Queens), NY 11378 (718) 507-3543	Pumkin Creek Video Production Harold Ferguson 321 Coffee Ave North Wilksboro, NC 28659 (919) 667-7717	Smokey Hills Public TV Lloyd Mintzmeyer PO Box 9 Bunker, KS 67626 (913) 483-6990	Video Management Systems Dan Hall 1004 E. Washington Street Indianapolis, IN 46202 (317) 639-6163
Ohio Bell Telephone Company Dave Kennett 100 Erie View Plaza, Rm 230 Cleveland, OH 44114 (216) 822-3770	Q-1 Video Network Tim Hart 62 Divison Coldwater, MI 49036 (517)279-8752	Strickland Video & Film Support John Strickland 2972 Chipmonk Trail Marietta, GA 30067 (404) 988-0803	Video Spectrum Wayne Stephaney 630 Hedgewick Dr Lancaster, PA 17603 (717) 394-4042
On Location Video Services Mr. Mel Rainer PO Box 35657 Houston, TX 77035 (713) 728-1020	Quail Video Products Bill Frazier 949 Penn Ave Pittsburg, PA 15221 (412) 243-1300	S & W Productions Terry Schmitt Tom Prigge 459 Broyles Ave Paducah, KY 42003 (502) 554-3057	Video Supply Sales Co. Mark Radford 3440 Oakcliff Rd. Suite 112 Atlanta, GA 30340 (404) 458-2468
Phillip Morris USA Carmen Inge / Paul Verway 8 Bells Road Richmond, VA 23230 (804) 274-3721	Reed Film & Video Lloyd Reed 4501 Sonata Court Fairfax, VA 22031 (703) 978-5988	Tentel Chuck Fodor 4475 Golden Foothills Pkwy El Dorado Hills, CA 95630 (800) 538-6894	VIDTEK James Lillis 9235 W. Capital Dr Milwaukee, WI 53222 (414) 466-7488
PKH Video Peter Hickman 1997 M-50 Tecumseh, MI 49286 (517) 423-2137	Riverside Film & TV Productions Rob Richardson, Jr. PO Box 543 Marietta, OH 45750 (614) 373-0861	TPI Productions-Bill Perkins 5410 Goldsboro Road Bethesda, MD 20817 (301) 320-5979	Vision Enterprises Michael P.O. Box 2698 Christiansburg, VA 24068 (703)382-0451

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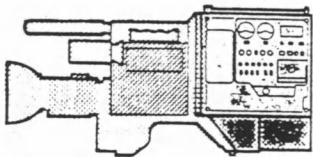
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Versatile Video Services, Inc.	WJAC
Terry Burke	Rob Abele
P.O. Box 333	1949 Hickory Ln
Yorktown, IN 47396	Johnstown, PA 15905
(317)759-4747	(814) 255-7600
Vlahos Communications	WPIX
Harvey Vlahos	Bob Murch
State RT 156	222 42nd St
Altamont, NY 12009	New York, NY 10017
(518) 861-8176	(212) 210-2552
VMAG-Kendra Cook	WPRI
5410 Goldsboro Road	Jim Cofta
Bethesda, MD 20817	25 Catamore Blvd
(301) 320-0077	E Providence, RI 02914
	(401) 438-7200
VPM Studios	WRAL
Gene Casaroll	Ron Tyndall
13761 Bell Court	2619 Western Blvd
Stirling Heights, MI 48312	Raleigh, NC 27606
(313) 939-8680	(919) 821-8520
Washington Natural Gas	WRC
John Cox	Harris Sullivan
815 Mercer Street	4001 Nebraska Avenue
Seattle, WA 98111	Washington, DC 20016
(206) 622-6767	(202) 885-4133
West Net Video	WTIV
Bob Abrahamson	Fred Baumgrtner
20023 Legend Oak Dr.	3490 Bluff Road
Humble, TX 77346	Indianapolis, IN 46202
(713) 852-7883	(317) 787-2211
Windstar Studios	WTVO
Dan Lawson/Mike Wemple	Al Petzke
525 Communications Cir.	1917 N Meridian Rd
Colorado Springs, CO 80905	Rockford, IL 61105
(719) 635-0422	(815) 963-5413
WFLA	WXYZ
Mike Healy	Mike Doback
905 E Jackson St	PO Box 789
Tampa, FL 33614	Southfield, MI 48037
(813) 228-8888	(313) 827-9490
WFTS	
Luis Romero	
Jean Varn	
4501 E Columbus Dr	
Tampa, FL 33605	
(813) 623-2828	

If you are not currently a member of the MII Users Association of America and would like to join, please contact us by phone, fax or mail at:

(800) 966-1030	MII Users Association of America
(703) 339-8500	C/o GMG International, Inc.
Fax (703) 339-5406	8580 Cinderbed Road, Suite 1000
	Newington, VA 22122
	Attn: Debbie

If you write or fax, please provide your name, company name, mailing address, phone number (fax too), and if you could tell us a little about your company and its MII use.



Model: All Models
Bulletin: TB90-100
Date: Jan. 15, 1991
Dist: D05/D15

Recommended Cleaning and Maintenance Procedure

Frequent cleaning and maintenance, as listed in this Technical Bulletin, will assure optimum performance and longer life of your MII VTR.

This Technical Bulletin is separated into two sections:

- A) Studio Units
- B) Portable Units

Please refer to the table of contents for your particular application.

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The Technical Support Division publishes Technical Bulletins for distribution to users of Panasonic broadcast equipment. Bulletins are distributed to aid in aligning, modifying and in servicing this equipment. The Technical Support Division assumes no responsibility to pay for modifications, supply parts, exchange new production units for early production units or any obligation to upgrade existing products.

1. REQUIRED MATERIAL

1. A "Lifting" solvent**
2. 100% Isopropyl Alcohol
3. Head Cleaning stick VFK 27* or Lint-Free Cloth (TEXWIPES)™
4. Canned Air
5. Molyton grease Panasonic part# MOR265

Note: *VFK 27 available through the parts dept.

**A popular lifting solvent is Freon.

2. RECOMMENDED SCHEDULE

1. Daily - Cleaning of Upper Drum & A/C Head Assy.
2. Weekly - Cleaning of Tape path ie, Upper and Lower Drum, A/C Head, Tape Post Guides, Pinch Roller, Capstan.
3. Monthly - Cleaning of Reel Base, Brakes, Cass Assy, Slip Rings, & Brush Assy.
4. 2000 Hrs. - Change Upper Drum, Pinch roller, Brush Assy.
5. 6 Months of Operation - Lubricate Gears and Mech. Parts/Check Tape Tension
6. 4000 Hrs. - Change Drum Unit (upper and lower), Assy. and Pinch Roller
7. Yearly - Clean out Machine with canned Air and Refer to the Manual's Maintenance Chart for Parts Replacement

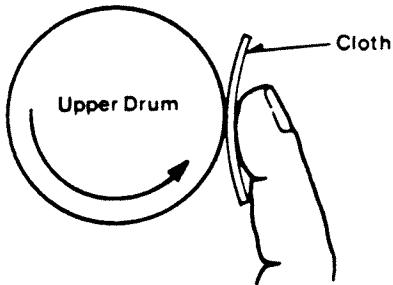
Note: Frequency of maintenance, depends on actual use. These intervals should reflect your actual situation and usage

Note: ALL procedures should be performed with AC Power OFF

3A. HEAD CLEANING METHOD:

Clean heads by applying even pressure and rotating upper drum (as shown). Never wipe in an up and down motion.

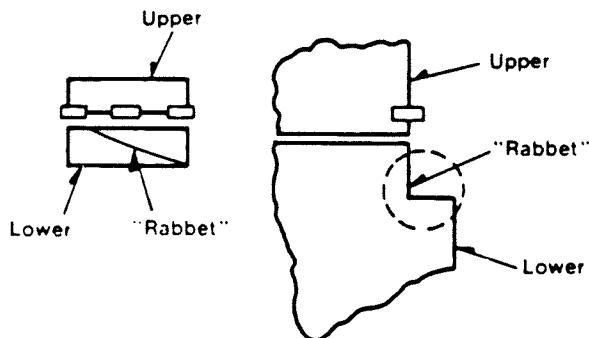
1. Clean with Alcohol
2. Clean with "Lifting solvent"
3. Wipe dry



The reason we recommend cleaning, first with Isopropyl, then a "Lifting Solvent" is that alcohol dissolves any organic foreign substances (dirt, finger prints, etc...) but dries too slowly and leaves a residue. "Lifting" solvents can't dissolve foreign substances, the use of only one, or the other is incomplete.

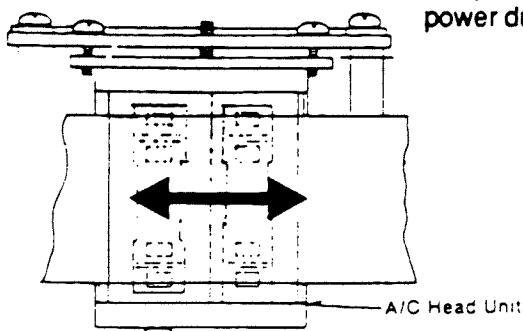
3B. LOWER DRUM CLEANING METHOD

Clean the rabbet guide with an alcohol soaked, sharpened toothpick. At this time use an inspection mirror to check for "scoring" or wear to drum assy.



3C. A/C HEAD CLEANING METHOD (STUDIO UNIT)

Clean the A/C head with alcohol then with Lifting Solvent. Check for scratches or scoring. Clean in a side to side motion only. Push the "Jog" and "Shuttle" simultaneously (cass. ejected) to move pinch roller away from A/C stack. To return pinch roller, press eject. (Turn off power during cleaning.)

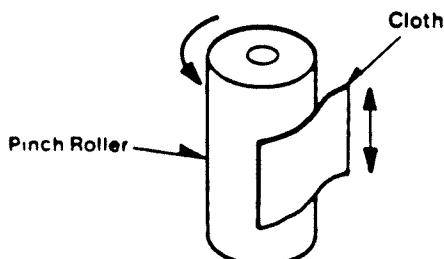


4. PINCH ROLLER, CAPSTAN, POST GUIDES CLEANING METHOD

Pinch Rollers should be cleaned with a 50% solution of Isopropyl Alcohol and a clean Texwipe® and wipe in a up and down motion.

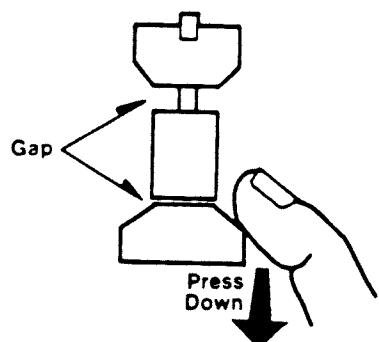
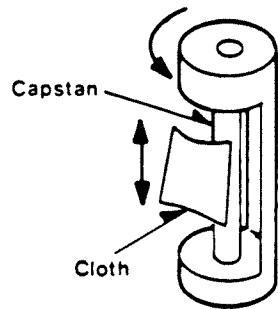
1. Wipe with 50% Isopropyl solution
2. Wipe with a clean dry Texwipe® and repeat until no rubber (dirt) comes off

Never use straight alcohol. It will disintegrate the rubber.



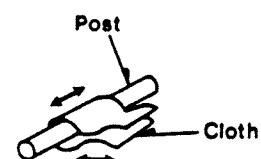
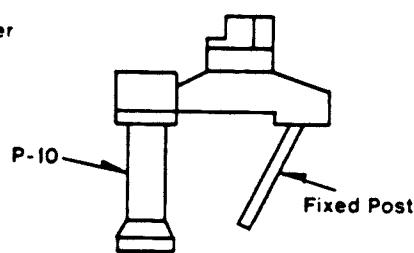
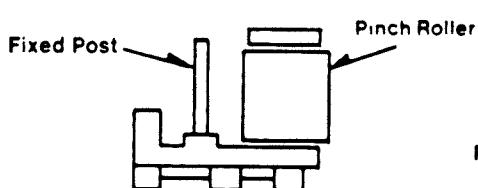
Capstan shaft should be cleaned with alcohol.

1. Wipe with alcohol soaked Texwipe®.
2. Wipe with dry Texwipe®.



Post guides P1 thru P12 should be pushed down to form a gap. Cleaning should be done with a dry Texwipe® only, so the ball bearings do not get damaged.

Fixed posts should be cleaned with alcohol. Wipe Texwipe® in same direction as tape travel. At this time you should check for a small groove (wear) where the tape edge travels.



5. PERIODIC MAINTENANCE & ADJUSTMENT PROCEDURE FOR BRUSH ASSEMBLIES

A. MONTHLY CLEANING PROCEDURE

1. Turn Power off.
2. Remove A/T & FE connectors
3. Remove the 2 Assy. mount screws (Fig. 1) & carefully remove the brush Assy.
4. With Alcohol soaked Texwipe®, carefully clean the brush contacts, contact grooves of slip ring Assy. See Fig. 2
5. Check for worn parts.
6. Reassemble

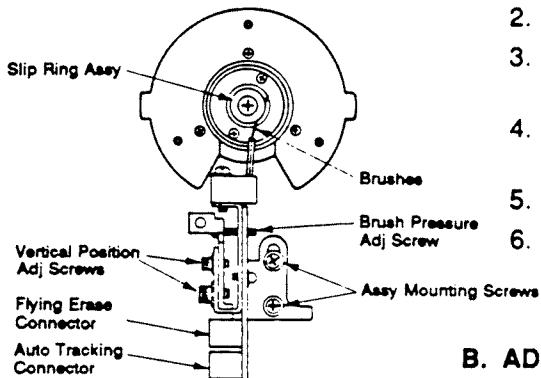


FIG. 1

Basically the same procedure is used for the earthing brush found on 400/500 & 620 units refer to Fig. 3.

B. ADJUSTMENT OF BRUSH ASSY.

1. Adjust the vertical position of the brushes. Make sure that they're aligned to the center of the slip ring grooves. As shown in Fig. 2
2. Adjust the brush pressure. The rubber covered base of the brushes should form a straight line with the center of the top of the slip ring Assy. As shown in Fig. 1. Refer to Fig. 4 for adjustment screw locations.

Note: Make sure that the brushes don't make a "cross connection".

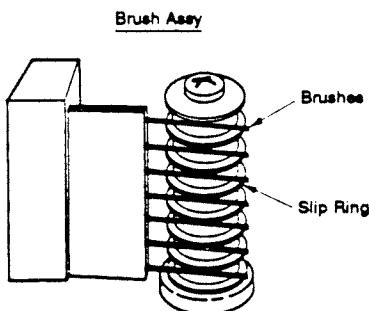


FIG. 2

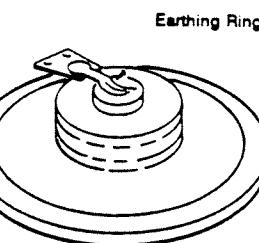


FIG. 3

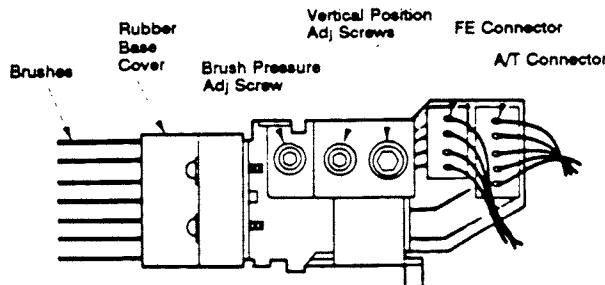
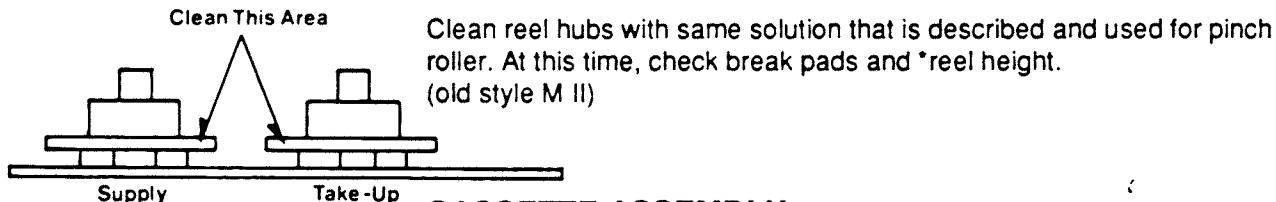


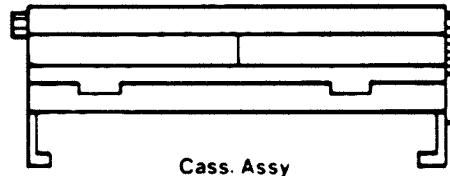
FIG. 4

6. BRAKES AND REEL TABLE



CASSETTE ASSEMBLY

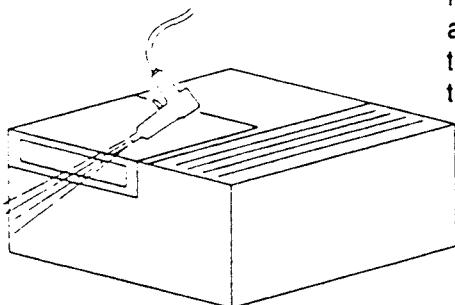
The cassette assembly should be vacuumed out for dust, then wiped down with alcohol, around front angle guides and top surface. At this time check L.E.D.'s and tape end sensors. Clean with contact RE-NU® or Gensolv 2010®.



7. CLEANING OF THE MACHINE'S INTERIOR

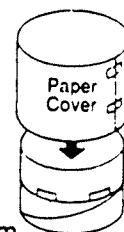
(EVERY 4000 HOURS OR EVERY 12 MONTHS OF OPERATION)

1) MECHANICAL SECTION



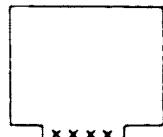
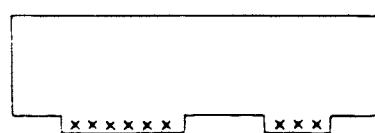
Remove the front loading mechanism and blow out the dust with an air-gun, as shown in the illustration. Be careful to blow the dust out of the machine, not back inside it. Use the air gun to blow the dust from the front loading mechanism too.

Note: Cover the upper drum assy. to keep dust out of the video heads.



2) ELECTRICAL SECTION

Blow the dust from the gaps between the printed-circuit boards with the air-gun. Remove the bottom plate from the machine and blow the dust from around the mother board and the fan motor unit. Clean edge connectors with Gensolv 2010®.



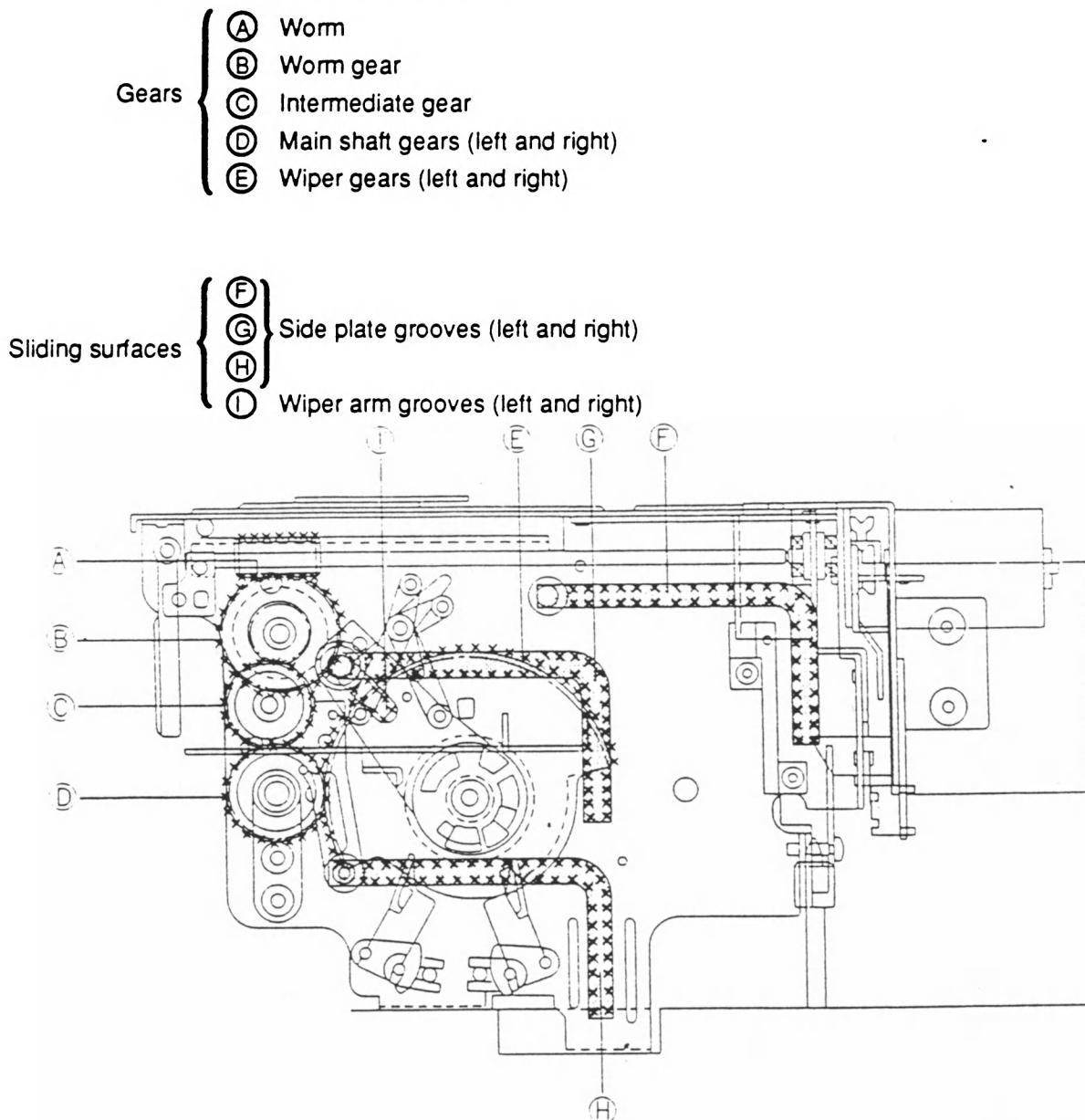
8. LUBRICATION OF MOVING PARTS

Follow the previously described intervals with care to lubricate only those parts involved (don't make a mess). At the same time check for worn parts and replace as necessary. Application should be done with a cotton swab or a toothpick.

Refer to Fig. 5, 6, 7

8A. Front Loading Unit

Grease this section as described for the mechanical parts. After applying the grease, raise and lower the cassette 2 or 3 times to spread the grease uniformly.



8. LUBRICATION OF THE GEARS AND SLIDING SURFACES (EVERY 2000 HOURS OR EVERY 6 MONTHS OF OPERATION)

8B. MECHANICAL PARTS — AU 660 SERIES

Apply a small amount of Molyton grease to the areas indicated in the drawing and spread it thinly with sharpened stick. If dust or dirt is found mixed with the old grease during the initial check, wipe it off with a cloth before applying the new grease. After applying the grease, repeat the loading and unloading operation 2 or 3 times to spread the grease uniformly, and remove any excess grease.

Gears	<ul style="list-style-type: none">(A) Sub-loading gear 1(B) Sub-loading gear 2(C) T. Tension Control Gear(D) Ring gear(E) Gear (upper and lower)(F) Worm gear
Sliding surfaces	<ul style="list-style-type: none">(G) Sliding contact between the slide lever and base of the reel base. (SLIDE LEVER)(H) Sliding contact between the pressure lever and P1 driverrrod pin. (HOLDER LEVER)(I) Sliding contact between the pressure lever and P1 arm drive pin. (HOLDER LEVER)(J) T. Tension control Gear locking pins (2)(K) T. Tension Control Gear groove(L) Square hole in P1 control rod B(M) Sliding contact between the TR stopper lever and the pinch lever pin. (STOPPER LEVER)(N) Sliding contact between the unload detect lever and the turn roller arm. (UNLOADING ARM)

Notes:

1. Remove the carriage before applying the grease.
2. Grease the T. Tension Control Gear in the tape-unloaded position. Then set the machine to the tape-loaded position and then apply grease to the areas that were inaccessible before.
Press the ring drive gear down and manually rotate the loading ring to set the machine in the tape-loaded position.

8C. AU-65 SERIES

The actual greasing procedure is the same as for the AU-650 Series, but the type of grease is different in some places. Refer to the attached sheet.

Gears	<ul style="list-style-type: none">(A) Ring Intermediate gear 1(B) Ring Intermediate gear 2(C) Cam gear(D) Compact cassette worm(E) Ring gears (upper and lower)(F) Intermediate gear	Type of grease Froiral G-31SB, or equivalent
Sliding surfaces	<ul style="list-style-type: none">(G) Unload detect lever(H) TR stopper lever(I) P1 drive rod(J) Upper of the cam worm wheel (cam area)...Froiral G-31SB, or an equivalent.	Molyton grease MOR 265, or equivalent

Note:

Grease the cam gear (C) in the tape-unloaded position, as shown in Fig. 2. Then set the machine to the tape-loaded position and apply grease to the areas which were inaccessible before. The procedure to set the machine in the tape-loaded position is described above.

AU-660 SERIES

MAINTENANCE PARTS LOCATION

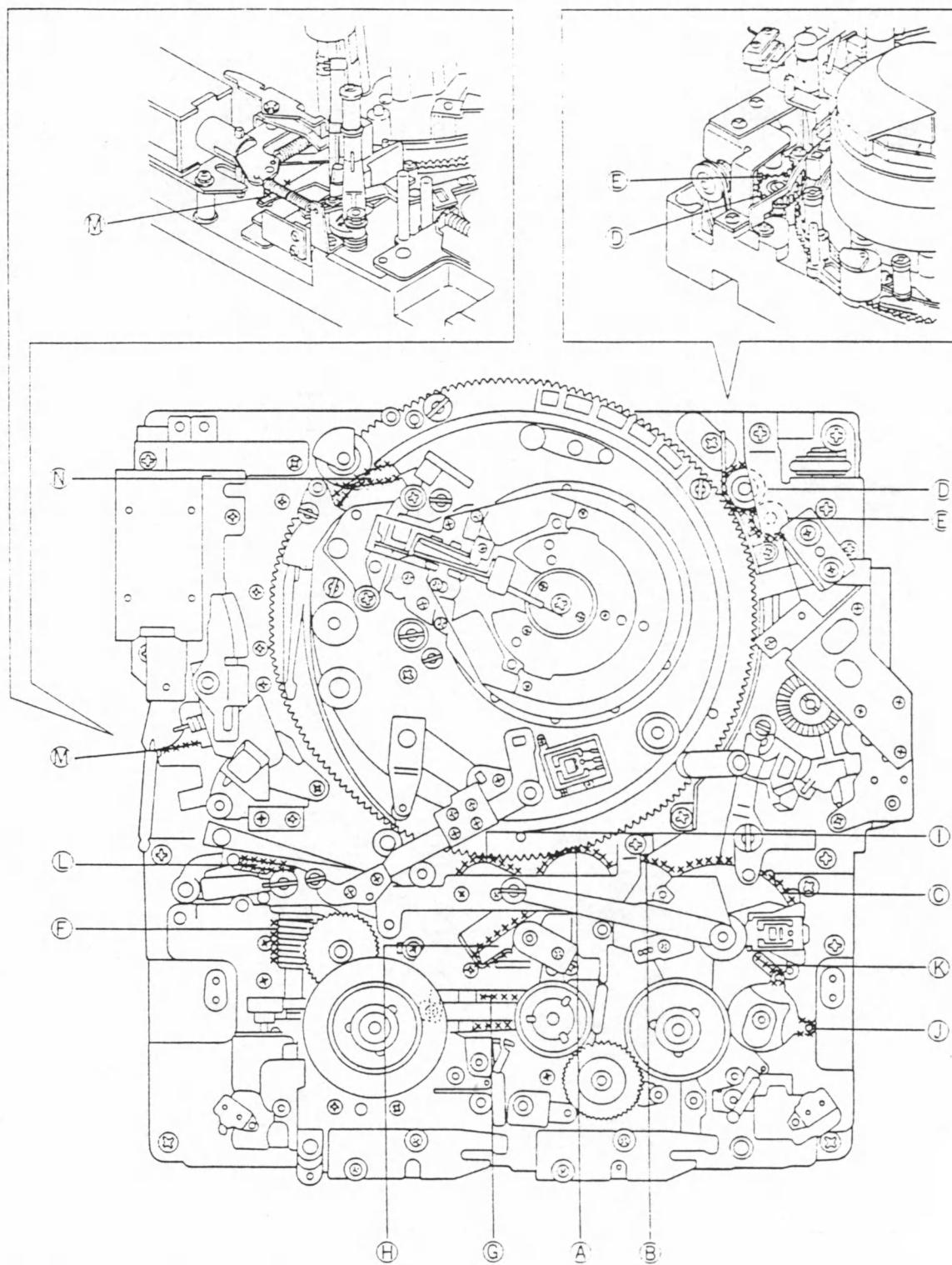


FIG. 6

AU-65 SERIES

MAINTENANCE PARTS LOCATION

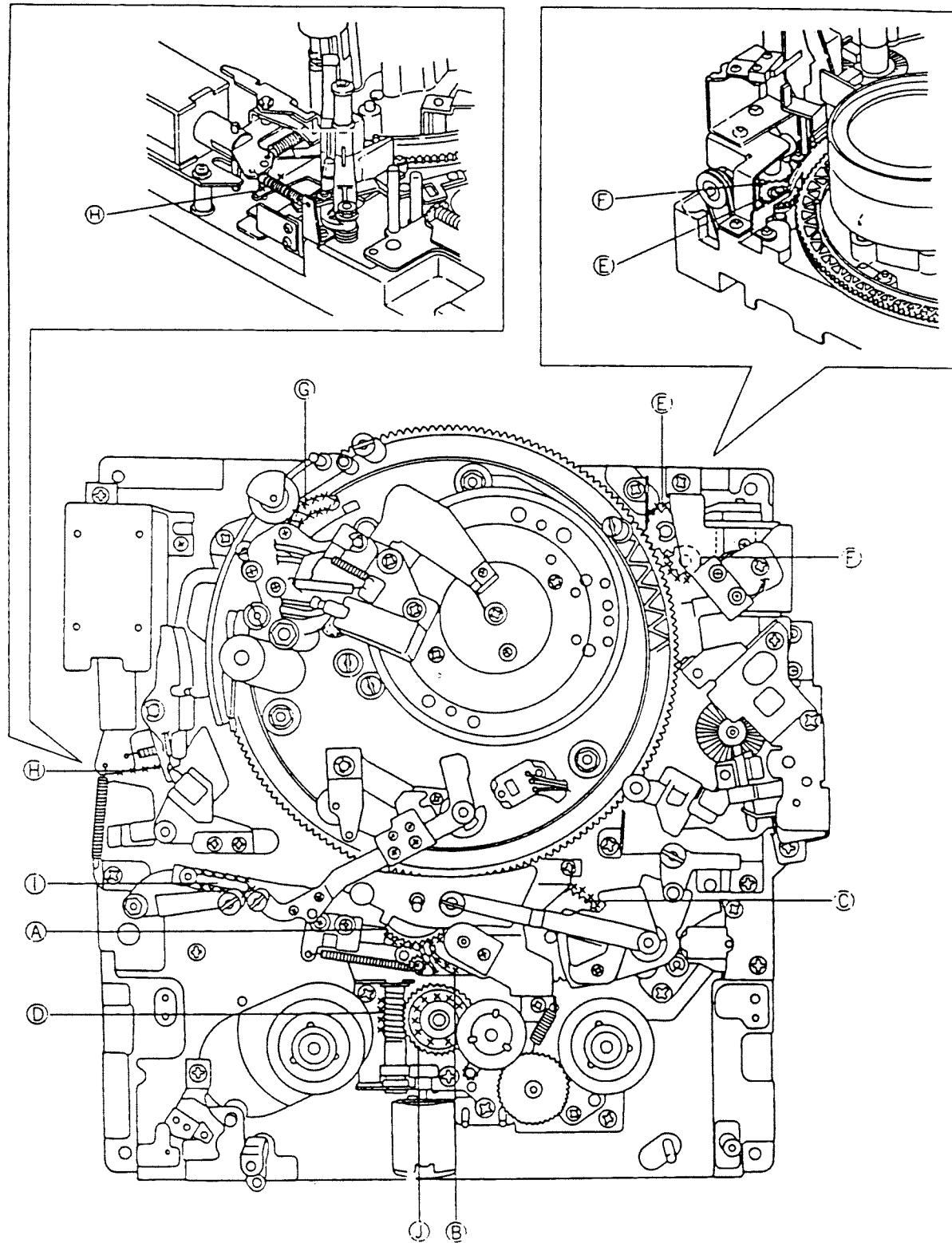
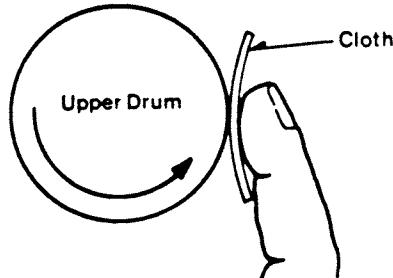


Fig. 7

9A. HEAD CLEANING METHOD:



Clean heads by applying even pressure and rotating upper drum (as shown). Never wipe in an up and down motion.

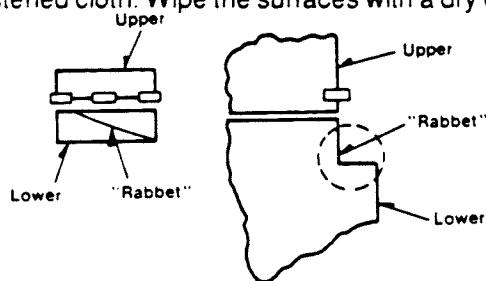
1. Clean with Alcohol
2. Clean with "Lifting" Solvent
3. Wipe dry

Note:

The reason we recommend cleaning, first with Isopropyl, then a "Lifting" Solvent is that alcohol dissolves any organic foreign substances (dirt, finger prints, etc...) but dries too slowly and leaves a residue. "Lifting Solvents" can't dissolve foreign substances. The use of only one, or the other is incomplete.

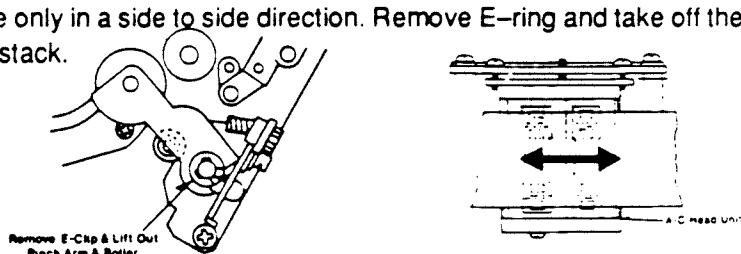
9B. LOWER DRUM

Clean dirt from the rabbet guide with a toothpick. Clean the guide surface and the portion of the lower drum that comes in contact with the video tape. Use an alcohol moistened cloth. Wipe the surfaces with a dry cloth after cleaning.



9C. A/C HEAD ASSY AND FE HEAD

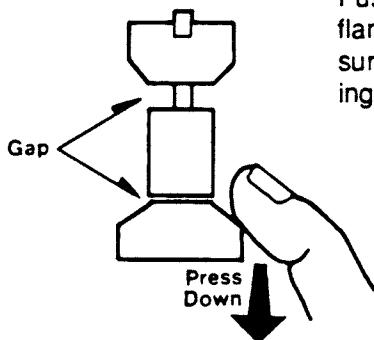
Wipe the front surfaces of the heads with a cleaning cloth or a Kim Wipe moistened with alcohol. Wipe the surfaces with a dry cloth after cleaning. Wipe only in a side to side direction. Remove E-ring and take off the pinch arm to have better access to the A/C stack.



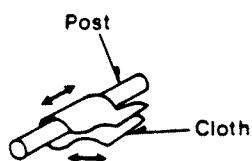
10. PINCH ROLLER, CAPSTAN MOTOR, TIMER ROLLER, ROLLERS OF P1 THROUGH P11

While rotating the pinch roller by hand, wipe the roller surface up and down with a cloth or a Kim Wipe moistened with alcohol, as shown in the illustration. Wipe the entire surface of the pinch roller. Continue this operation until no more rubber (dirt) is removed.

Repeat this procedure for the capstan motor, timer roller, and rollers of P1 through P11. For tape guides, use only a dry kimwipe because alcohol will damage the ball bearings.

10A. FLANGES OF P1 TO P11

Push down on the post flange by finger and hold it to open a gap between the flange and the roller, as shown in the diagram. Wipe any dirt from the flange surface in contact with the tape and from the end of the roller with a dry cleaning cloth or a Kim Wipe®. Do not use alcohol.

10B. P2 POST (INCLINED POST)

When cleaning a fixed post, such as a guide post or an inclined post, wrap the cloth around the post in the same way as the tape wraps around it, as shown in the illustration. Clean the post along its entire length. Check for wear.

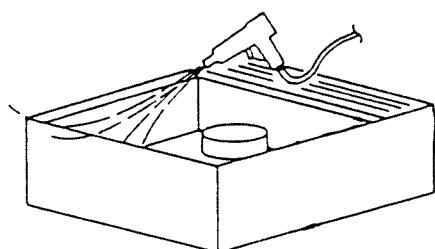
11. CLEANING OF THE CASSETTE UP UNIT (MONTHLY)

Use a vacuum cleaner to clean the dust from the surface of the cassette holder and wipe the surface of the cassette with a dry cloth or a Kim Wipe®.

12. CLEANING OF THE INSIDE MACHINE (EVERY 12 MONTHS)

Check inside the machine. If dust has collected inside the machine, remove the carriage and exterior panels and blow out the dust with an air-gun, as shown in the illustration.

Note: Cover video heads.



13. LUBRICATE THE GEARS AND SLIDING SURFACES (EVERY 12 MONTHS)

Check the gears and sliding surfaces shown in Fig. 7 and apply new grease if it is required. Apply a small amount of Molyton grease to the areas indicated on the drawing and spread it thinly with a sharpened stick. If dust or dirt is found mixed with the old grease during the initial check, wipe it off with a cloth before applying the new grease. After applying the grease, repeat the loading and unloading operation 2 or 3 times to spread the grease uniformly, and remove any excess grease.

LUBRICATION GUIDE

Gears { (A) Cam gear (gear area)
(B) Worm gear (Loading Motor)
(C) Worm gear (for Small Reel U/D Motor) (AU-500 Series only)

Sliding surfaces { (D) Cam gear (cam groove)
(E)
(F)
(G) Loading guide

Note:

It is easier to grease the AU-500 series worm gear (B) if the VIDEO 1 printed circuit board is removed.

14. AU, 410, 500, 505, 520

PORTABLE CHASSIS

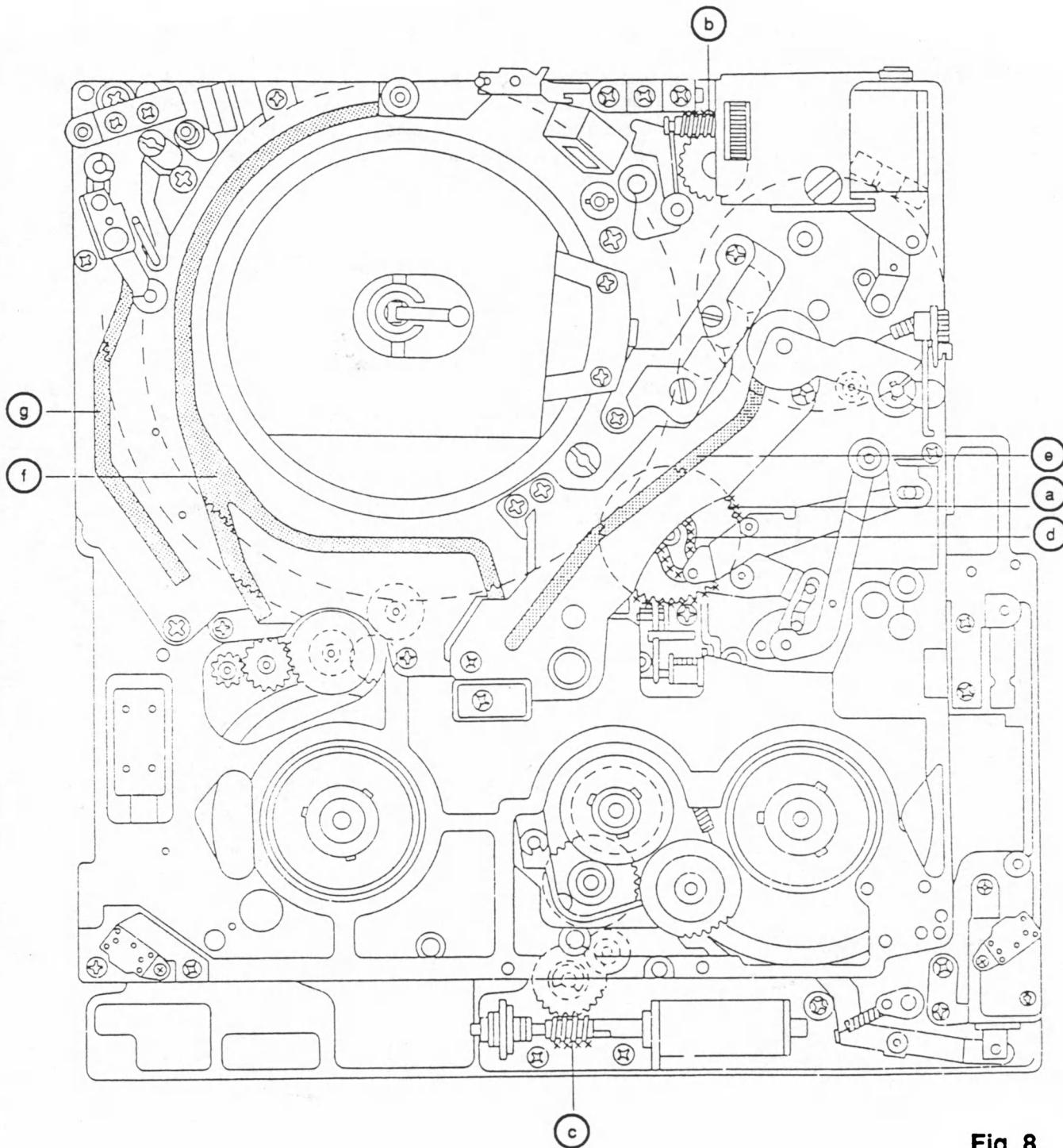


Fig. 8